

**NOTE****Isolation and chemical Investigation of Bioactive Saponin from *Tridex procambens* for Antiasthmatic Activity**

HIRDESH NAGINA, MAMTA PATEL, D.K. JAIN and R.C. SAXENA\*  
*Pest Control and Ayurvedic Research Laboratory. S.S.L. Jain College  
Vidisha-464 001, India*

*Tridex procambens* is a terrestrial weeds, widely distributed in tropical climate. This plant yields saponin like compound. Flavone glucoside 5,3',4'-trihydroxy-7,5'-dimethoxy-5-O- $\alpha$ -L-methyl pyranoside, which have shown antiasthmatic activity both in water as well as in alcoholic extract. Maximum mast cell degranulation activity was noted as 100 mg/kg body weight dose causing 67 % inhibition decreasing mast cell activity.

**Key Words:** Antiasthmatic, Saponin, *Tridex procambens* mast cell

In recent years, there is a great interest in the herbal medicines among the scientific communities because of the increased awareness of the people and pharmaceutical companies to control major diseases by herbal formulation. The people belong to rural areas make use of various medicines based on their traditional knowledge. Asthma is one of the disease associated with air pollution and standard of living. Asthma is a disease related with the air passage or respiratory tract. Asthma and allergy both are associated to each other. The mechanism of inflammatory response resulting in asthma is a complex process, which involves numerous cell types including mast cells.

Mast cells are found in connective tissue and blood vessels and subcutaneous tissue of the body. Mast cells release various substances including histamine. Histamine is a potent substance which is released by the mast cells during asthmatic attack. Looking to the side effect of allopathic medicines many medicinal plants have been tested to prepare herbal drugs for bronchial asthma. The present paper reports the detail of the chemistry of biologically active compound used in antiasthmatic activity.

*Tridex procambens* is common grass found in tropical climate growing primarily during rainy season. The extracts of *Tridex procambens* have been reported to have various pharmacological effects, antimicrobial activity against both gram positive and gram negative bacteria and

stimulated wound healing<sup>1</sup>. Sinha and Dogra<sup>2</sup> also reported pharmacological study of the medicinal plants and mentioned that it would be quite helpful for commercial utilization of the medicinal plants in the country. Leaves of *Tridax procumbens* are used for curing bronchial catarrh. Leaf juice is also insecticidal and pesticidal<sup>3</sup>. *Tridax procumbens* roots give the indication of the presence of 5,7,4'-trihydroxy-6',3'-dimethoxy flavone molecules<sup>4</sup>.

Saponin isolated from *Tridax procumbens* was tested against the asthma induced mast cells of albino rat. 48 Albino rats of either sex weighed between 175-200 g were used for the study.

**Extraction and characterization:** The collected plant material was washed thoroughly in water and shed dried plant material was grinded and powdered material was extracted in 90 % methanol and water, respectively by using soxhlet apparatus. The weight of the powder was 600 g in 600 mL solvent, which yielded, greenish colour semisolid crude of about 3.84 g in 90 % alcohol and 16.5 g in water. The crude extracts were used for experimental bioassay.

The crude extract of the plant was taken in the glass vial and shake it then fog was formed in the glass vial which showed the presence of the saponin in the given sample. Crude was used for the study of UV and NMR. The crude extract was tested on albino rats.

It was thought important to investigate the chemical nature of saponin from the weeds *Tridax procumbens* commonly known as titikass, against antiasthmatic activity of the mast cells.

**Antiasthmatic effect of saponin:** During the experiment, inhibition of granulation of mast cells was tested by the crude extract of *Tridax procumbens*. When extract given in three different doses of 25, 50 and 100 mg/kg body weight it caused maximum 67 % inhibition in 90 % alcoholic extract shown as in Table-1.

TABLE-1

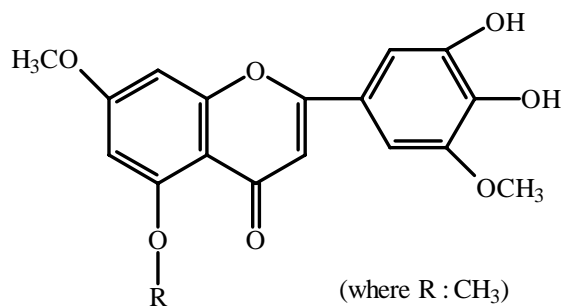
Extract	Dose mg/kg body weight	Inhibition	
		Experiment I	Experiment II
Water extract	25	0	0
	50	20	20
	100	21	22
90 % Alcohol extract	25	20	25
	50	35	52
	100	65	67

After two weeks, sensitization of the antigen change deregulation about 79 % of the mast cells when the sensitized animals were treated with

reference drug (25, 50, 100 mg/kg) for two weeks and then challenged with an antigen there was a significant reduction in the number of disrupted mast cells.

**Structure elucidation:** Finally extracted purified solid found biologically active against asthma conformed by bioassay. Which when analysed under different analytical procedure shows following results in UV spectrum a maximum peak was found at 240 nm, m.w. 344, IR (KBr,  $\text{cm}^{-1}$ ) 2984 (C-H arom.), 1542 (C=O), 1277 (C-O-C), 1244 (C-O-C asym.), 1071 (C-O).  $^1\text{H NMR}$ : s 7.31-7.21 (5H), s 5.29 (1H), s 4.93-4.70 (2H) s 4.28-4.20 (4H).

Thus, the tentative structure of compound<sup>5</sup> which was elucidated as m.f.  $\text{C}_{18}\text{H}_{16}\text{O}_7$  may probably as:



Flavone glucoside-5,3',4'-trihydroxy-7-5'-dimethoxy-5-O- $\alpha$ -L-methyl pyranoside.

## REFERENCES

1. R.N. Chopra, S.L. Nayar and I.C. Chopra, Glossary of Indian Medicinal Plant, CSIR Publication, New Delhi (1984).
2. S.K.P. Sinha and J.V.V. Dongra, *Int. J. Crud. Drug Res.*, **23**, 77 (1985).
3. D. Shukla, R.C. Saxena, P. Raghuvanshi, V.K. Sharma, D.K. Mishra, I.P. Saxena and M.C. Koli, *Environ. Conserv. J.*, **2**, 33 (2001).
4. M.G. Sieera, M.I. Colombo, M.E. Zudenigo and E.A. Revada, *Phytochemistry*, **23**, 1685 (1984)
5. Dobriner, *Infrared Absorption Spectra of Glucoside*, Inter Science Publication (1953).

(Received: 19 April 2006;

Accepted: 1 February 2007)

AJC-5402